

Course Outline

COURSE: CSIS 274 **DIVISION:** 50 **ALSO LISTED AS:**

TERM EFFECTIVE: Fall 2011 **Inactive Course**

SHORT TITLE: TELECOM/NETWK CABLE

LONG TITLE: Telecommunication and Network Cabling

<u>Units</u>	<u>Number of Weeks</u>	<u>Type</u>	<u>Contact Hours/Week</u>	<u>Total Contact Hours</u>
2	18	Lecture:	1	18
		Lab:	3	54
		Other:	0	0
		Total:	4	72

COURSE DESCRIPTION:

This course provides an introduction to telecommunications and network cabling. Students will receive hands-on training in installing, terminating, testing, and troubleshooting both copper and fiber optic-based cabling systems. This course has the option of a letter grade or pass/no pass.

PREREQUISITES:

COREQUISITES:

CREDIT STATUS: C - Credit - Degree Non Applicable

GRADING MODES

- L - Standard Letter Grade
- P - Pass/No Pass

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

- 02 - Lecture and/or discussion
- 03 - Lecture/Laboratory
- 04 - Laboratory/Studio/Activity

STUDENT LEARNING OUTCOMES:

1. Students will have an insight into the field of Telecommunications.
2. They will have the knowledge and skills necessary to become entry level technicians in the network cabling industry.

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS

Inactive Course: 04/25/2011

WEEK HOURS CONTENT

1 4 The Interactive Physical Layer & Telecommunications from the Beginning.

OUT-OF-CLASS ASSIGNMENT: Text, Module 1 & 2.

OBJECTIVES: Identify the "Physical Layer" components of the various telecommunications systems represented on the ITB. Trace the signal flow of the telecommunications systems represented on the ITB. Demonstrate knowledge of the basic functions of the "DAVE-3" test set and use it to determine the continuity of test cable and the different telecommunicaitons systems represented on the ITB. Identify how the Student Personal Optical Tester (SPOT) is used to check continuity of Fiber Optic System on the ITB. Define the communication process. Identify key developments in the history of telecommunications as it pertains to the following devices: Telegraph, Telephone, Radio, Television, Computer Networks, Facsimile Machine, Cellular Telephone. Identify the (Physical Layer) cabling systems used for the distribution of data, voice and video in the systems defined above.

2 4 Transmission Media and Physical Layer Components and Do It Right. Do It Safe.

OUT-OF-CLASS ASSIGNMENT: Text, Module 3 & 4.

OBJECTIVES: Define the level or category associated with the different types of twisted pair cabling systems. Define the reasoning for the twisted pair system that includes noise reduction and cross talk elimination techniques. Identify 2-Pair System Cabling characteristics that include pair, tip, and ring identification. Identify 4-Pair System Cabling characteristics that include pair, tip, and ring identification. Demonstrate and identify pair to pin configuartins using the EIA/TIA 570 Standard. Define the characteristics of Coaxial Cable systems to include BNC and F-Type connectors. Define characteristics of Fiber Optic Cable systems and ST connector. Identify safety precautions that insure personal protection. Define key points concerning safety on the job site. Define safety in dealing with Electrical Equipment. Identify and explain common safety procedures when working with hazardous materials.

3 4 Tools, Construction Techniques & Test Equipment

utilized in Network Cabling.

OUT-OF-CLASS ASSIGNMENT: Text, Module 5.

OBJECTIVES: Identify and use 2-pair and Coaxial Cable Stripping Tools. Identify and use the RJ-11 stripping and crimping tool. Safely and correctly strip and terminate a 2 pair telephone cable with RJ-11 connectors. Safely and correctly strip and terminate a Coaxial Cable with screw-on F-type connectors. Perform continuity checks on newly constructed cables using the "DAVE-3" test set.

4 4 Testing and Troubleshooting the Physical Layer and Telecommunications: A Glimpse to the Future.

OUT-OF-CLASS ASSIGNMENT: Text, Modules 6 & 7.

OBJECTIVES: Define the terms testing, troubleshooting, and preventive maintenance. Perform operational checks on the "DAVE-3" to insure its ability to test the systems of the ITB. Perform end-to-end signal testing using the "DAVE-3" to test entire cabling systems on the ITB. Perform selective testing of individual cabling subsystems on the ITB. Identify the basic characteristics of the following basic Troubleshooting Techniques: the Split Half Method, Fault Isolation Techniques, Hard Fault Troubleshooting, and Intermittent Faults. Identify the use of Patch Cords, Adapters and Bridging Clips to simulate or to correct Physical Layer malfunctions on the ITB. Define Smart House and identify its component parts that include wiring infrastructure, personal computers and smart devices. Identify possible future developments in wireless systems. Identify possible future developments in consumer electronics.

5-6 8 The "ACT with DAVE" Training Aid. Twisted Pair Cabling Systems.

OUT-OF-CLASS ASSIGNMENT: Text, Copper Cabling, Module 1 & 2.

OBJECTIVES: Identify all components of the ACT unit. Identify all aspects of the Banner Board. Identify all components of the DAVE-3 units. Identify the tool kit contents. Identify the characteristics and application of twisted pair cables. Identify the characteristics and applications of 4-pair UTP cables. Identify the three types of configurations for terminating twisted pair on modular patch cords, plugs, and outlets. Identify configuration and application of 66-type terminal block, 110-type terminal block and a modular patch panel. Identify characteristics and application of screened 4-pair twisted cable and 25 pair UTP cables.

7-8 8 Installation Techniques, Safety Precautions and Tools.

OUT-OF-CLASS ASSIGNMENT: Copper Cabling Module 3.

OBJECTIVES: Identify and explain the safety procedures and precautions that should be followed for personnel protection, worksite safety, and for the prevention of electrical hazard. Identify and explain the safety procedures and precautions that should be followed when working with hazardous materials and tools and equipment and for fire preventions and safety. Identify the minimum distance requirements between network cables and power sources. Identify types and location for cable supports. Identify and describe the step-by-step process used to pull cable and install cable in buildings. Identify and describe the tools used in network cabling.

9-10 8 4-Pair Cabling Systems.

OUT-OF-CLASS ASSIGNMENT: Copper Cabling Module 4 & 5.

OBJECTIVES: Terminate an unshielded twisted pair cable to an 8P8C plug 568B. Terminate a screened twisted pair cable to an 8P8C plug 568B. Troubleshoot a pair to pin configuration. Terminate and test 4-pair UTP cable to 66 and 110 connections blocks and modular jacks. Identify the application, configuration, construction and color code for 2-pair STP cable. Terminate the IBM 2-pair cable with the 4-position UDC.

11-12 8 Coaxial Cable.

OUT-OF-CLASS ASSIGNMENT: Copper Cabling Module 6.

OBJECTIVES: Identify the characteristics, type, and applications of coaxial cable. Identify characteristics, type and application of coaxial connectors. Identify tools for installing connectors on coaxial cable. Terminate and test coaxial cable systems.

13 4 Codes and National Standards.

OUT-OF-CLASS ASSIGNMENT: Copper Cabling Module 7.

OBJECTIVES: Identify the purpose and application of the N.E.C. Codes as they pertain to network cabling. Identify the N.E.C. Electrical Code Limited Energy Articles. Identify the major elements of ANSI/TIA/EIA 568-A Standard. Identify and explain the standards as applied to horizontal cabling. Identify and explain the cabling requirements for new installations. Identify and explain the standards as applied to backbone cabling. Identify and explain the 568-A standard for buildings, UTP and ScTP cables.

14 4 Introduction to Fiber Optics, Fiber Optic Concepts

OUT-OF-CLASS ASSIGNMENT: Fiber Optic Cabling, Modules 1 and 2.

OBJECTIVES: Identify the tools and equipment used to terminate and test fiber optic cables. Define fiber optic terminology and explain fiber optic concepts. Identify the five elements of a typical fiber optic system and briefly explain the function of each element. Identify two light sources used in fiber optic transmission. Identify the characteristics of various optical detectors. Identify the structure of fiber optics and the characteristics of light. Explain attenuation and identify causes of attenuation in fiber optic cable.

15-16 8 Fiber Optic System Components
Placing Fiber Optic Cables

ASSIGNMENT:

Fiber Optic Cabling Module 3 & 4

OBJECTIVES: Identify and describe the function of the components used in a fiber optic system. Identify the step-by-step procedure for placing fiber optic cables in a building. Identify the characteristics and construction of loose core fiber optic cable; and tight core fiber optic cable; and compare their construction. Identify and describe fiber optic connecting devices. Identify each fiber optic connector and identify the characteristics and use of a fiber optic connector. Identify the ten-step sequence for placing a fiber optic cable in a building. Identify the steps to place a pulling string in a pathway. Identify the safety precautions and procedures that must be followed when placing fiber optic cable.

17 4 Testing Fiber Connectors; Installing Fiber Connectors.

OUT-OF-CLASS ASSIGNMENT: Fiber Optic Cabling, Module 5 and 6.

OBJECTIVES: To perform a fiber optics continuity test utilizing the DAVE-2 or SPOT tester and understand the functionality of the different types of fiber optic testing. Explain the differences among a continuity test, an attenuation test, and or OTDR test. Identify the tools and step-by-step process used to attach a fiber connector to a fiber. Identify and describe the safety procedures that must be followed when installing a fiber optic cable. Terminate ST II+ Fiber Optic Connectors on fiber optic building cable and patch cord.

18 2 Final.

METHODS OF INSTRUCTION:

Lecture, faculty model demonstrations, student practice kits (interactive boards), computer demonstrations.

METHODS OF EVALUATION:

The types of writing assignments required:

Written homework

Lab reports

The problem-solving assignments required:

Homework problems

Field work

Lab reports

Quizzes

Exams

The types of skill demonstrations required:

Class performance

Field work

Performance exams

The types of objective examinations used in the course:

Multiple choice

True/false

Other category:

None

The basis for assigning students grades in the course:

Writing assignments: 20% - 30%

Problem-solving demonstrations: 20% - 30%

Skill demonstrations: 30% - 40%

Objective examinations: 10% - 20%

Other methods of evaluation: 0% - 0%

REPRESENTATIVE TEXTBOOKS:

REQUIRED TEXT:

Introduction to Telecommunication, C-Tech Associates. 2000.

Reading level of text: 10th grade.

OTHER MATERIALS REQUIRED TO BE PURCHASED BY THE STUDENT:

Copper Based Kit (C-Tech) \$95

Fiber Optic Based Kit (C-Tech) \$195

ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:

CSU GE:

IGETC:

CSU TRANSFER:

Not Transferable

UC TRANSFER:

Not Transferable

SUPPLEMENTAL DATA:

Basic Skills: N
Classification: I
Noncredit Category: Y
Cooperative Education:
Program Status: 1 Program Applicable
Special Class Status: N
CAN:
CAN Sequence:
CSU Crosswalk Course Department:
CSU Crosswalk Course Number:
Prior to College Level: Y
Non Credit Enhanced Funding: N
Funding Agency Code: Y
In-Service: N
Occupational Course: C
Maximum Hours:
Minimum Hours:
Course Control Number: CCC000326189
Sports/Physical Education Course: N
Taxonomy of Program: 070810